

SPATS Regional Emissions Analysis

for the Spartanburg County Early Action Compact

Spartanburg Area Transportation Study

October 2005

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Executive Summary

This report demonstrates that the Spartanburg Area Transportation Study (SPATS) Metropolitan Planning Organization (MPO) long-range transportation plan eliminates or reduces violations of the national ambient air quality standards (NAAQS) in the MPO portion of Spartanburg County, South Carolina. The plan accomplishes the intent of the South Carolina Early Action Compact (EAC) State Implementation Plan (SIP). The MPO bases its regional emissions analysis using the transportation network approved by SPATS for the 2025 Transportation Plan and the emission factors developed by the South Carolina Department of Health and Environmental Control (SCDHEC).

USEPA designated Spartanburg County, South Carolina as a basic nonattainment area for ozone (O₃) under Subpart 1 of the Clean Air Act on April 15, 2004. The effective date of designation is deferred while South Carolina complies with the EAC.

The plan is fiscally constrained and identifies funding sources to the extent possible. SCDHEC prepared base and future emission rates for the vehicle fleet using Mobile 6.2. These rates were applied to VMT from the SPATS travel demand model to estimate emissions.

Introduction

This report documents the regional emissions reduction test, interagency consultation process, public involvement process, and analysis methodology for the emissions analysis completed for the SPATS MPO as part of the Early Action Compact implementation activities.

Regional Emissions Reduction Test

Table 1 shows the results of the baseline test and Table 2 shows the results of the build/no-build test. Both are represented in tons per day (tpd).

Table 1: Baseline Test Emissions

Year	NO _x (tpd)	VOC (tpd)
2002	17.96	10.58
2007	11.86	6.83
2025	3.6	3.63

Table 2: Build/No Build Test

Precursor	NO _x (tpd)		VOC (tpd)	
Year	No Build	Build	No Build	Build
2025	3.62	3.6	3.64	3.63

The emissions in each functional classification are calculated using the formula:

$$Emissions_{FC} = DVMT_{FC} \times EmissionsFactor_{FC}$$

Where:

Emissions_{FC} are the emissions in each functional classification,

DVMT is the Daily VMT in each functional classification, and

Emissions Factor_{FC} is the emissions factor for that functional classification. Emission Factors may be for either NO_x or VOC.

Daily emissions for each scenario are calculated by summing daily emissions across functional classes (in this case Interstates, Freeways, Arterials, Collectors and Locals).

Appendix A contains the emission calculation spreadsheets showing the VMT and speed for each functional classification and each scenario.

Scope

The Travel Model covers all of the SPATS MPO. All funded projects in the SPATS Long Range Transportation Plan are included in the Regional Model.

The Travel Demand Model

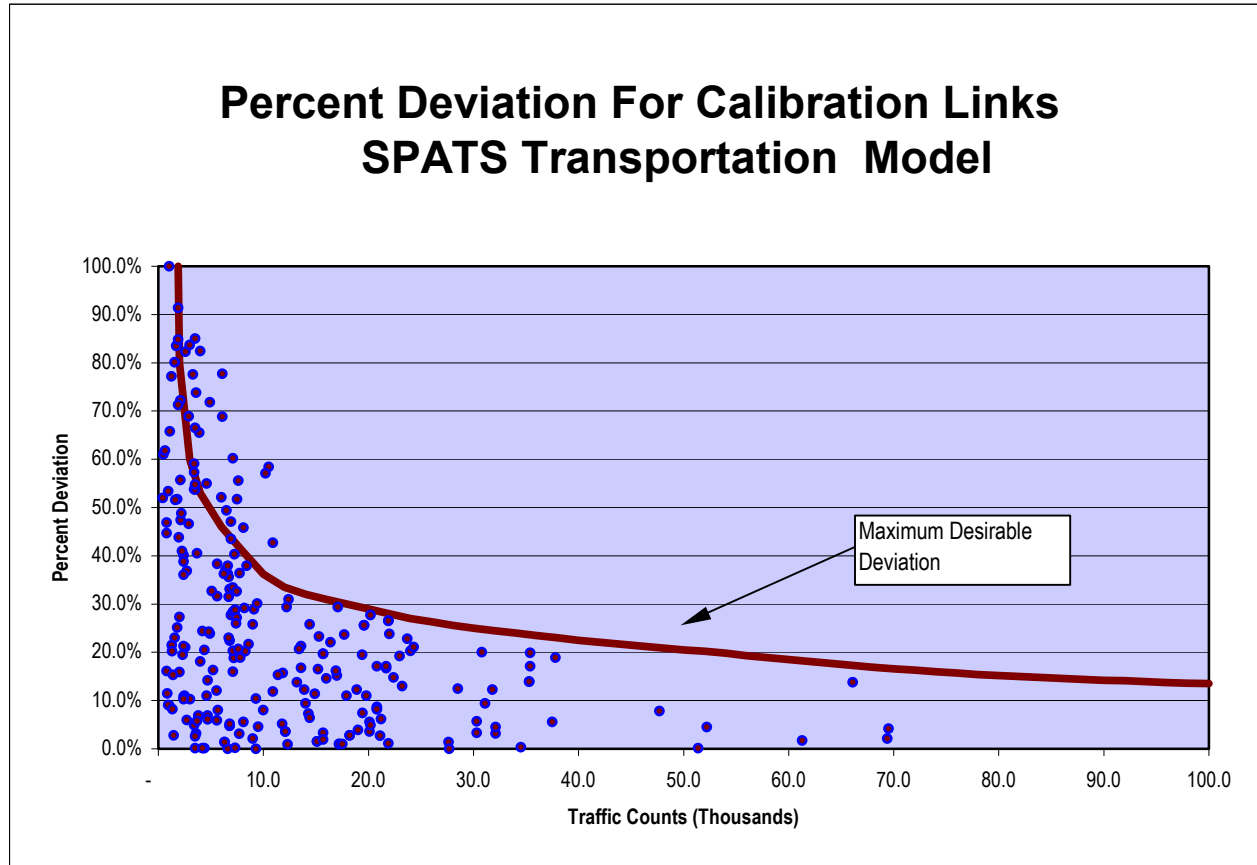
The South Carolina Department of Transportation provided transportation modeling support to SPATS for the regional emissions analysis. The SPATS travel demand model is a TRANPLAN based travel demand model that includes the trip generation, trip distribution, and trip assignment steps of the travel demand modeling process. The model uses the gravity model for trip distribution and the equilibrium trip assignment algorithm to assign traffic. The model does not include feedback loops from trip assignment to either trip generation or trip distribution.

SPATS/SCDOT last validated the model against ground counts in 2001. For the regional emissions analysis SPATS/SCDOT estimated trip tables for 2007 and 2025 by interpolation. Build and No-Build highway networks for the plan horizon year were also created. Table 3 and Figure 1 show the model calibration summary for the SPATS model.

Table 3: Model Calibration Statistics

Sub-Area	1999 Traffic Count	Assigned Volume	Ratio
CBD / Downtown	504,129	469,205	0.93
Westside	472,400	458,371	0.97
Boiling Springs / Northside	444,684	457,920	1.03
Reidville Area	341,422	335,075	0.98
Eastside	318,942	313,904	0.98
Duncan /Wellford/ Lyman	306,203	293,712	0.96
Southside	176,550	165,048	0.93
TOTAL	2,564,330	2,493,235	0.97

Figure 1: Percent Deviation for Calibration Links



The Emissions Model

The South Carolina Department of Health and Environmental Control (SCDHEC) performed emissions modeling using EPA's latest emissions model, MOBILE6.2. The SCDHEC developed MOBILE 6.2 input files using a mix of national default data and locally collected data. The SCDHEC used the North Spartanburg ambient air quality monitoring station for the temperature source to develop maximum and minimum temperature values for the analysis. The primary Mobile 6.2 local input parameters for this report include:

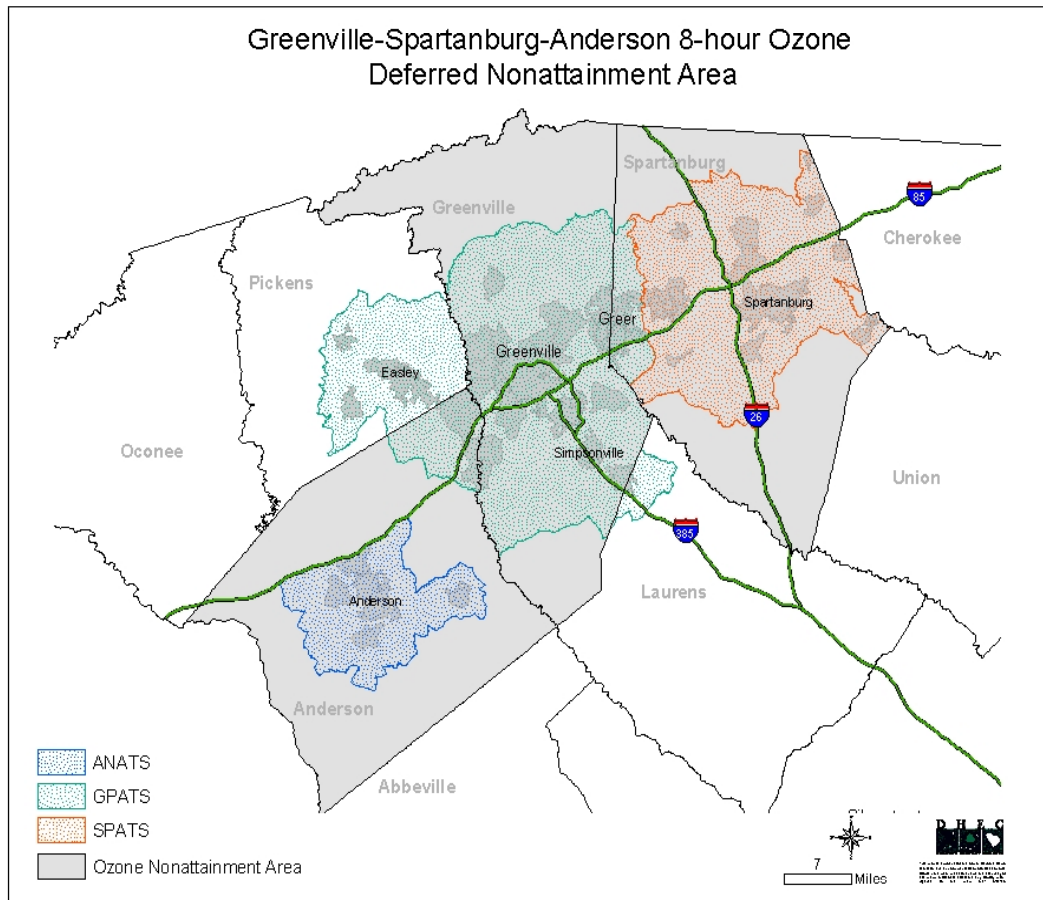
1. Minimum/maximum temperatures (63.5, 89.9).
2. Fuel Reid Vapor Pressure (9.0 psi).
3. No refueling.
Emissions that occur during refueling are excluded from the emission estimates.
4. Average speed.
5. Vehicle Miles Traveled by Facility.

Appendix D includes the MOBILE 6.2 files.

Air Quality Planning

USEPA declared Spartanburg County, South Carolina basic nonattainment for ozone under Subpart 1 of the Clean Air Act on April 15, 2004. The effective date of designation is deferred while South Carolina complies with the EAC. Figure 2 shows the Spartanburg County ozone nonattainment area.

Figure 2: Ozone Nonattainment area



Spartanburg County joined SCDHEC in an EAC SIP to demonstrate a reduction of air pollutants without the prescriptive requirements of a nonattainment SIP. The EAC includes a plan for reducing ozone precursors to a level that demonstrates compliance with the NAAQS by December 31, 2007, and maintains the standard through 2017.

SCDHEC and SCDOT, in consultation with EPA, FHWA and FTA, developed a "Smart Highways" approach to estimating on-road mobile source emissions. This Smart Highways report for the SPATS MPO was produced by SCDOT and SCDHEC in coordination with SPATS staff.

Transportation Planning

The 2025 Long Range Transportation Plan for SPATS is an update of the previous long-range transportation plan for SPATS. The socioeconomic data and fiscal constraint elements of this LRTP include forecasts to the Design Year 2025.

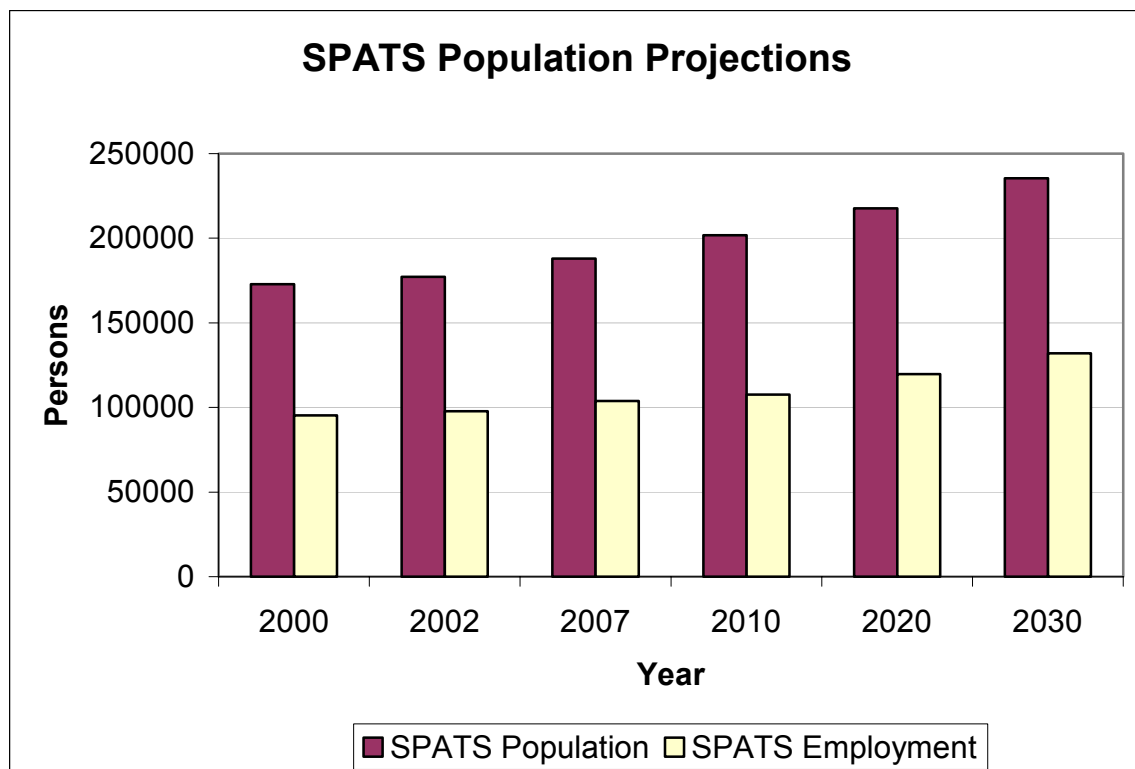
Financial Constraint

The SPATS MPO fiscally constrained Long-Range Transportation Plan is based on historic and anticipated funding availability. Within the plan, SPATS has identified funding sources, and associated them with projects to the extent possible. In addition debt service has been included in estimating future funding streams. Between now and 2025 the expected funding stream is approximately \$5.213 million per year. After accounting for debt service the total funding estimate is \$3.15 million by 2022. These transportation networks described in Appendix B of this report and in the 2025 Long Range Transportation Plan.

Latest Planning Assumptions

SPATS developed its 2025 long-range transportation plan with the latest planning assumptions. Population and employment were developed using a step down method to develop regional control totals and then distributing population and employment by classification to individual traffic analysis zones. SPATS staff used expert panels to assist in developing the control totals and the intensity of development in each traffic analysis zone. Figure 3 summarizes the population and employment data for each horizon year of the travel demand model.

Figure 3: SPATS Population and Employment



Interagency Consultation

The documentation in this report was the subject of interagency consultation. Interagency consultation began in January 2003 and continued through completion of the emissions analysis with regular meetings to discuss and agree upon schedules, model parameters, latest planning assumptions, horizon years, exempt projects, and regionally significant projects. Copies of notes from these meetings are included in Appendix C of this report.

Public Involvement

SPATS handled public review of this report in accordance with the public involvement policy approved on August 11, 2003. A copy of this policy is available from the MPO. A key element of the public involvement process is a public review of transportation planning documents including the Long-Range Transportation Plan.

Conclusion

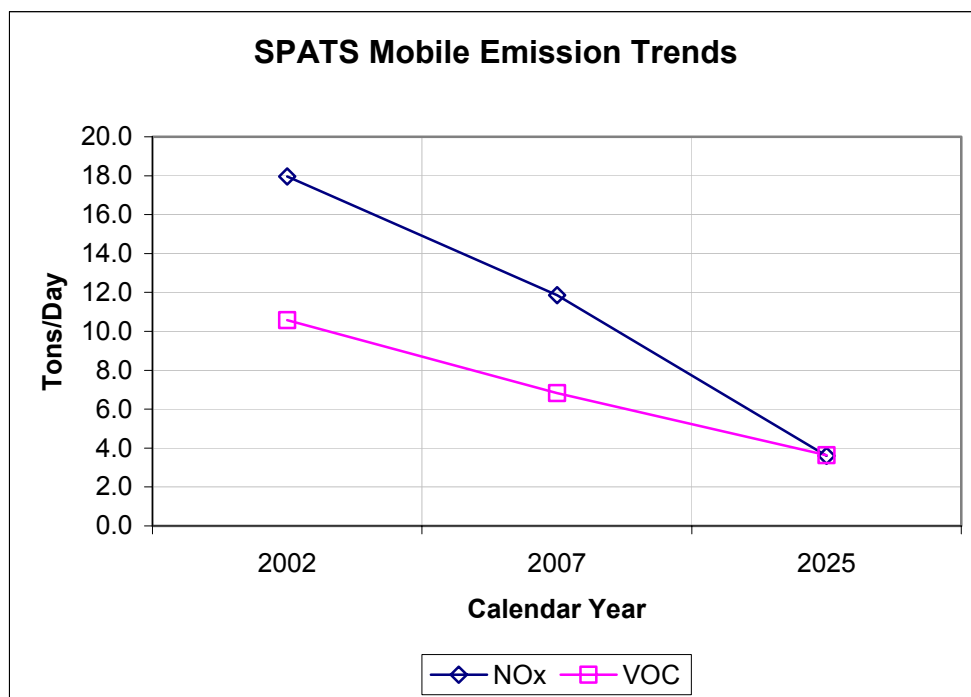
Based on the analysis and consultation discussed above the emissions expected from implementing the proposed 2025 SPATS long-range transportation plan are less than emissions from either the baseline case or the no build case.

Appendix A: Emission Calculation Spreadsheets

2002 BASE YEAR							
Facility Type	VHT	Speed	DVMT	NOx EF g/mi	NOx (tons/day)	VOC EF g/mi	VOC (tons/day)
Interstate	39,078.0	54.81	2,141,911.0	3.109	7.338	1.379	3.255
Freeway	5,274.1	49.04	258,619.6	2.855	0.814	1.419	0.404
Arterial	48,739.7	38.96	1,898,780.6	2.383	4.986	1.493	3.124
Collector	32,051.7	36.01	1,154,265.0	2.359	3.001	1.526	1.941
Local	44,922.7	15.11	678,937.9	2.435	1.822	2.483	1.858
Total	170,066.2	36.06	6,132,514.1		17.961		10.582
2007 (No Build)							
Facility Type	VHT	Speed	DVMT	NOx EF g/mi	NOx (tons/day)	VOC EF g/mi	VOC (tons/day)
Interstate	44,105.0	53.40	2,355,420.0	1.936	5.025	0.877	2.276
Freeway	5,279.4	49.06	259,000.8	1.808	0.516	0.899	0.257
Arterial	48,243.6	39.24	1,893,283.8	1.558	3.251	0.953	1.988
Collector	30,732.7	36.31	1,115,829.0	1.542	1.896	0.974	1.198
Local	44,672.5	15.11	674,910.9	1.678	1.248	1.560	1.160
Total	173,033.2	36.40	6,298,444.5		11.936		6.879
2007							
Facility Type	VHT	Speed	DVMT	NOx EF g/mi	NOx (tons/day)	VOC EF g/mi	VOC (tons/day)
Interstate	43,750.0	53.39	2,335,709.0	1.935	4.981	0.877	2.257
Freeway	4,626.5	49.09	227,136.8	1.808	0.453	0.899	0.225
Arterial	48,415.6	40.11	1,942,111.9	1.563	3.345	0.947	2.027
Collector	29,696.7	36.36	1,079,810.0	1.542	1.835	0.974	1.159
Local	44,680.0	15.11	675,004.9	1.678	1.248	1.560	1.160
Total	171,168.8	36.57	6,259,772.6		11.861		6.829
2025 (No Build)							
Facility Type	VHT	Speed	DVMT	NOx EF g/mi	NOx (tons/day)	VOC EF g/mi	VOC (tons/day)
Interstate	72,071.2	45.46	3,276,194.0	0.391	1.412	0.344	1.242
Freeway	7,665.7	48.41	371,106.4	0.399	0.163	0.338	0.138
Arterial	64,059.0	36.80	2,357,543.1	0.369	0.959	0.363	0.943
Collector	49,302.9	34.65	1,708,291.0	0.367	0.691	0.370	0.697
Local	60,890.4	15.10	919,213.8	0.393	0.398	0.616	0.624
Total	253,989.2	33.99	8,632,348.3		3.622		3.644

2025							
Facility Type	VHT	Speed	DVMT	NOx EF g/mi	NOx (tons/day)	VOC EF g/mi	VOC (tons/day)
Interstate	75,113.5	44.50	3,342,690.0	0.388	1.429	0.346	1.275
Freeway	6,422.3	48.56	311,871.0	0.400	0.137	0.338	0.116
Arterial	64,968.9	37.89	2,461,775.4	0.370	1.004	0.360	0.977
Collector	45,278.2	34.73	1,572,330.0	0.367	0.636	0.370	0.641
Local	60,837.4	15.10	918,713.8	0.393	0.398	0.616	0.624
Total	252,620.3	34.07	8,607,380.2		3.604		3.632

Calendar Year					
	2002	2007	2025	2007nb	2025nb
NOx	17.961	11.861	3.604	11.936	3.622
VOC	10.582	6.829	3.632	6.879	3.644



Appendix B: Transportation Network Descriptions

SPATS Long-Range Plan 2005 - 2025			
No.	Project	Estimate	Comment
1	Intersection Improvements <i>Various Intersection Improvements</i>	\$8,500,000	Estimate 20 intersections at typical cost between \$300,000 and \$600,000 each
2	SC 9 <i>SC 292 to Rainbow Lake Rd</i>	\$18,100,000	Widen to 5 lanes
3	Old Furnace Rd** <i>US 176 to SC 9</i>	\$9,000,000	PE* and ROW* only (for eventual widening to 5 lanes)
4	US 176 <i>Old Furnace to US 176\SC 56 Split</i>	\$3,000,000	Median/right turn lanes/ Additional east bound lane between Springfield and US 176/SC 56 split.
5	Parris Bridge Rd** <i>Old Furnace to SC 9</i>	\$4,500,000	PE* and ROW* only (for eventual widening to 5 lanes)
6A	Skylyn\Cannons Campground\ Gossett <i>Drayton Rd to south of I-85</i>	\$16,260,000	Widen to 5 lanes
6B	Plainview Drive** <i>US 29 to Cannons Campground</i>	\$3,600,000	Widen to 5 lanes
7	Oak Grove Road <i>S. Blackstock to US 296</i>	\$5,530,000	Widen to 5 lanes
8	Nazareth Ch. Rd. Realignment** <i>US 29 to south of rail track</i>	\$500,000	PE* only; Public/Private funding; Realignment of existing roads from US 29 to south of rail track.
Total Estimate		\$68,990,000	* PE = Preliminary Engineering, ROW = Right-of-Way
Maximum Total		\$69,000,000	
**Additional funds needed for completion: #3 - \$11 million; #5 - \$10 million; #6B - \$500,000; #8 - \$4 million			

Appendix C: Interagency Consultation Meeting Notes

Smart Highways Workgroup Updates

January 27, 2003 – Initial meeting held between EPA, FHWA, DOT, and DHEC. DOT and FHWA are to work out involving the MPOs. Group feels it will be beneficial to implement some conformity type processes (lack of better word) – and formed a workgroup. The workgroup held a conference call – DOT is putting together some information concerning the technical process and will submit it for review.

February 10, 2003 – Workgroup has been getting input from the counties and the MPOs about the process.

March 3, 2003 – John Gardner with DOT has some ideas out for starting points. Group has reviewed and will discuss during the next conference call.

March 17, 2003 – Group decided that approach is a good idea. John Gardner and Dan Hinton are going to evaluate the conformity checklist for items that can be pulled for approach. John is also going to check for an inventory of what VMT information is available. Tonya, Melinda and Henry are drafting the process for the agencies to follow based on priority given to non-attainment areas to include a “what if” approach. Lynorae had some comments from EPA that she is going to provide in the next day or so. All of these deliverables are to be completed by March 21st. After everyone has reviewed, we will set up another conference call.

March 24, 2003 – Waiting on John Gardner and Dan Hinton to evaluate the conformity checklist for items that can be pulled for approach. Also waiting on John to check for an inventory of what VMT information is available. We (DHEC) have drafted and sent out to the rest of the group a process for the agencies to follow based on priority given to non-attainment areas to include a “what if” approach. After everyone has reviewed, we will set up another conference call to discuss.

April 7, 2003 – Discussed proposals and checklist developed by participants. Lynorae Benjamin (EPA) was unable to participate on call, which limited some of the discussion, but we have since caught up via individual phone messages. John Gardner (DOT) will be drafting a plan from the DOT perspective for the group to be delivered in two weeks.

April 14, 2003 – Awaiting a draft plan from John Gardner at DOT.

May 27, 2003 – The Southern Environmental Law Center is very interested in participating in this approach and has submitted a letter with their concerns. Several of the MPOs have also expressed an interest in being involved as well. Once John has completed draft, we will reconvene and will certainly welcome the additional stakeholders.

August 18, 2003 – John Gardner has provided transportation plans from several MPOs to potentially be used as a guide.

August 25, 2003 – John will send a smart highways checklist around to folks by next week. Lynorae will develop a “flowchart”, to include “what ifs”. She will send it out by September 5th. The group will review the documents and get back together on September 10th for another call.

September 1, 2003 – A conference call will be held on Wednesday, September 10th.

September 8, 2003 – The group is currently awaiting the review of the *GRATS long-range transportation document. We plan to possibly meet on October 8th for our next discussion. (*GRATS will be referred to later as GPATS due to changes in their organizational boundary)

January 30, 2004 – A meeting is scheduled for February 12th here in Columbia. We will discuss the conformity process and develop a Smart Highways approach.

February 27, 2004 – There was representation by DHEC, EPA, MPOs, FHWA, and DOT during the meeting held February 12th. There were several presentations at the meeting and we discussed the conformity process and the Smart Highways approach.

August 27, 2004 – FHWA sent out checklist to group and a conference call was held with DOT, FHWA, EPA, and MPOs on September 2nd to finalize checklist. Sent out new version of checklist today. Inter-agency partners will have upper management review. Plan is to share with Southern Environmental Law Center in the next couple of weeks for their comments. Additionally, DHEC has drafted language addressing the checklist to be placed in the EAC SIP.

September 30, 2004 – Awaiting comments from SELC.

October 29, 2004 – Finalized and out on public comment with the rest of EAC stuff.

January 31, 2005 – Meeting to discuss status and make preparations for EAC obligations.

February 25, 2005 – Awaiting submittal of VMT and speed data from the 4 MPOs. It is due March 16th.

March 31, 2005 – We have received VMT and speed data from GPATS, ANATS, and COATS. That data will be placed into Mobile 6 so that an emissions analysis can be completed. We are still awaiting SPATS.

April 29, 2005 – We have received VMT and speed data from all the MPOs and are completing Mobile 6 baseline analysis.

May 31, 2005 – The Smart Highways analyses were completed. Currently, the MPOs, DOT, and DHEC are writing up the associated reports.

June 30, 2005 – June 27th we sent reports rewrites to DOT. On July 7th we met with DOT and the MPOs to answer questions about the report. Our target completion date for the reports is August 1st.

July 29, 2005 – We are still finalizing the assessment documents for each area.

August 31, 2005 – Have made some changes to the Smart Highways Reports. Awaiting feedback from COATS.

September 29, 2005 – DHEC completed review of reports and redistributed them as final drafts.

Appendix D: Mobile 6.2 Files

```
*****
* MOBILE6.2.03 (24-Sep-2003)
* Input file: C:\MOBILE6\RUN\DATA\SPATS02N.IN (file 1, run 1).
*****
```

M616 Comment:

User has supplied post-1999 sulfur levels.

M603 Comment:

User has disabled the calculation of REFUELING emissions.

```

* #####
* Interstate 54.81 MPH
* File 1, Run 1, Scenario 1.
* #####

```

M582 Warning:

The user supplied freeway average speed of 54.8 will be used for all hours of the day. 100% of VMT has been assigned to a fixed combination of freeways and freeway ramps for all hours of the day and all vehicle types.

M 48 Warning:

```
there are no sales for vehicle class HDGV8b
```

Calendar Year:	2002
Month:	July
Altitude:	Low
Minimum Temperature:	63.5 (F)
Maximum Temperature:	89.9 (F)
Absolute Humidity:	75. grains/lb
Nominal Fuel RVP:	9.0 psi
Weathered RVP:	8.7 psi
Fuel Sulfur Content:	279. ppm

Exhaust I/M Program:	No
Evap I/M Program:	No
ATP Program:	No
Reformulated Gas:	No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000

Composite Emission Factors (g/mi):

Composite VOC :	1.299	1.422	2.274	1.640	1.379	0.584	0.782	0.459	2.42	1.379
Composite NOX :	1.234	1.462	1.817	1.553	5.668	1.948	2.012	20.194	1.47	3.109

```
* * * * *
* Freeway 49.04 MPH
* File 1, Run 1, Scenario 2.
```


* #####

M582 Warning:

The user supplied freeway average speed of 49.0
will be used for all hours of the day. 100% of VMT
has been assigned to a fixed combination of freeways
and freeway ramps for all hours of the day and all
vehicle types.

M 48 Warning:

there are no sales for vehicle class HDGV8b

Calendar Year: 2002
Month: July
Altitude: Low
Minimum Temperature: 63.5 (F)
Maximum Temperature: 89.9 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 9.0 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 279. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: No
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:	-----	<6000	>6000	(All)	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.4568	0.3091	0.1063	-----	0.0360	0.0008	0.0017	0.0833	0.0060	1.0000

Composite Emission Factors (g/mi):										
Composite VOC :	1.335	1.465	2.345	1.690	1.438	0.596	0.798	0.479	2.26	1.419
Composite NOX :	1.211	1.431	1.786	1.522	5.427	1.620	1.673	17.547	1.29	2.855

* #####

* Principal Art 38.96 MPH

* File 1, Run 1, Scenario 3.

* #####

M583 Warning:

The user supplied arterial average speed of 39.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M 48 Warning:

there are no sales for vehicle class HDGV8b

Calendar Year: 2002
Month: July
Altitude: Low
Minimum Temperature: 63.5 (F)

Maximum Temperature: 89.9 (F)
 Absolute Humidity: 75. grains/lb
 Nominal Fuel RVP: 9.0 psi
 Weathered RVP: 8.7 psi
 Fuel Sulfur Content: 279. ppm

Exhaust I/M Program: No
 Evap I/M Program: No
 ATP Program: No
 Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000

Composite Emission Factors (g/mi):										
Composite VOC :	1.400	1.524	2.450	1.761	1.652	0.646	0.865	0.561	2.33	1.493
Composite NOX :	1.158	1.358	1.714	1.449	5.026	1.372	1.416	12.728	1.18	2.383

* #
 * COLLECTOR 36.01 MPH
 * File 1, Run 1, Scenario 4.
 * #

M583 Warning:
 The user supplied arterial average speed of 36.0
 will be used for all hours of the day. 100% of VMT
 has been assigned to the arterial/collector roadway
 type for all hours of the day and all vehicle types.

M 48 Warning:
 there are no sales for vehicle class HDGV8b

Calendar Year: 2002
 Month: July
 Altitude: Low
 Minimum Temperature: 63.5 (F)
 Maximum Temperature: 89.9 (F)
 Absolute Humidity: 75. grains/lb
 Nominal Fuel RVP: 9.0 psi
 Weathered RVP: 8.7 psi
 Fuel Sulfur Content: 279. ppm

Exhaust I/M Program: No
 Evap I/M Program: No
 ATP Program: No
 Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

VMT Distribution:	0.4568	0.3091	0.1063	0.0360	0.0008	0.0017	0.0833	0.0060	1.0000
-------------------	--------	--------	--------	--------	--------	--------	--------	--------	--------

Composite Emission Factors (g/mi):

Composite VOC :	1.429	1.549	2.489	1.790	1.749	0.669	0.895	0.599	2.38	1.526
-----------------	-------	-------	-------	-------	-------	-------	-------	-------	------	-------

Composite NOX :	1.152	1.349	1.706	1.440	4.915	1.353	1.396	12.569	1.16	2.359
-----------------	-------	-------	-------	-------	-------	-------	-------	--------	------	-------

[illegible]

* LOCAL 15.11 MPH

* File 1, Run 1, Scenario 5.

* #

* Reading Hourly Roadway VMT distribution from the following external

```
* data file: C:\MOBILE6\RUN\FVMTLOCL.D
```

Reading User Supplied ROADWAY VMT Factors

M585 Warning:

100% of VMT has been assigned to the local roadway type for all hours of the day for all vehicle types with an average speed of 12.9 mph.

M 48 Warning:

```
there are no sales for vehicle class HDGV8b
```

Calendar Year: 2002

Month: July

Altitude: Low

Minimum Temperature: 63.5 (F)

Maximum Temperature: 89.9 (F)

Absolute Humidity: 75. grains/lb

Nominal Fuel RVP: 9.0 psi

Weathered RVP: 8.7 psi

Fuel Sulfur Content: 279. ppm

Exhaust I/M Program: No

Evap I/M Program: No

ATP Program: No

Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
---------------	------	--------	--------	------	------	------	------	------	----	---------

	<6000	>6000	(All)
--	-------	-------	-------

VMT Distribution: 0.4568 0.3091 0.1063 0.0360 0.0008 0.0017 0.0833 0.0060 1.0000

Composite Emission Factors (g/mi):

Composite VOC :	2.310	2.410	3.733	2.749	4.286	1.095	1.461	1.298	3.47	2.483
-----------------	-------	-------	-------	-------	-------	-------	-------	-------	------	-------

Composite NOX :	1.168	1.308	1.671	1.401	4.035	1.803	1.862	13.972	0.92	2.435
-----------------	-------	-------	-------	-------	-------	-------	-------	--------	------	-------

* MOBILE6.2.03 (24-Sep-2003) *

* Input file: C:\MOBILE6\RUN\DATA\SPATS07B.IN (file 1, run 1). *

M616 Comment:

User has supplied post-1999 sulfur levels.

M603 Comment:

User has disabled the calculation of REFUELING emissions.

* #

* Interstate 53.39 MPH

* File 1, Run 1, Scenario 1.

* #

M582 Warning:

The user supplied freeway average speed of 53.4
will be used for all hours of the day. 100% of VMT
has been assigned to a fixed combination of freeways
and freeway ramps for all hours of the day and all
vehicle types.

M 48 Warning:

there are no sales for vehicle class HDGV8b

Calendar Year: 2007
Month: July
Altitude: Low
Minimum Temperature: 63.5 (F)
Maximum Temperature: 89.9 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 9.0 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 33. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: No
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.3872	0.3600	0.1237		0.0359	0.0004	0.0019	0.0854	0.0056	1.0000

Composite Emission Factors (g/mi):										
Composite VOC :	0.823	0.867	1.408	1.005	0.859	0.285	0.500	0.318	2.31	0.877
Composite NOX :	0.752	0.958	1.333	1.054	3.742	0.966	1.236	11.589	1.42	1.935

* #

* Freeway 49.09 MPH

* File 1, Run 1, Scenario 2.

* #

M582 Warning:

The user supplied freeway average speed of 49.1

will be used for all hours of the day. 100% of VMT
has been assigned to a fixed combination of freeways
and freeway ramps for all hours of the day and all
vehicle types.

M 48 Warning:

there are no sales for vehicle class HDGV8b

Calendar Year: 2007
Month: July
Altitude: Low
Minimum Temperature: 63.5 (F)
Maximum Temperature: 89.9 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 9.0 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 33. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: No
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3872	0.3600	0.1237		0.0359	0.0004	0.0019	0.0854	0.0056	1.0000

Composite Emission Factors (g/mi):										
Composite VOC :	0.845	0.887	1.445	1.030	0.890	0.290	0.509	0.330	2.25	0.899
Composite NOX :	0.741	0.943	1.316	1.038	3.623	0.849	1.086	10.305	1.29	1.808

* #

* Principal Art 40.11 MPH

* File 1, Run 1, Scenario 3.

* #

M583 Warning:

The user supplied arterial average speed of 40.1
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M 48 Warning:

there are no sales for vehicle class HDGV8b

Calendar Year: 2007
Month: July
Altitude: Low
Minimum Temperature: 63.5 (F)
Maximum Temperature: 89.9 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 9.0 psi

Weathered RVP: 8.7 psi
Fuel Sulfur Content: 33. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: No
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.3872	0.3600	0.1237		0.0359	0.0004	0.0019	0.0854	0.0056	1.0000

Composite Emission Factors (g/mi):										
Composite VOC :	0.892	0.925	1.512	1.075	0.993	0.311	0.548	0.377	2.30	0.947
Composite NOX :	0.711	0.899	1.266	0.993	3.381	0.722	0.923	7.941	1.18	1.563

* #####
* COLLECTOR 36.36 MPH
* File 1, Run 1, Scenario 4.
* #####

M583 Warning:
The user supplied arterial average speed of 36.4
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M 48 Warning:
there are no sales for vehicle class HDGV8b

Calendar Year: 2007
Month: July
Altitude: Low
Minimum Temperature: 63.5 (F)
Maximum Temperature: 89.9 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 9.0 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 33. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: No
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.3872	0.3600	0.1237		0.0359	0.0004	0.0019	0.0854	0.0056	1.0000

Composite Emission Factors (g/mi):										

Composite VOC :	0.917	0.944	1.546	1.098	1.058	0.326	0.574	0.409	2.36	0.974
Composite NOX :	0.706	0.891	1.259	0.985	3.289	0.708	0.905	7.794	1.16	1.542

* #####
 * LOCAL 15.11 MPH
 * File 1, Run 1, Scenario 5.
 * #####

* Reading Hourly Roadway VMT distribution from the following external
 * data file: C:\MOBILE6\RUN\FVMTLOCL.D

Reading User Supplied ROADWAY VMT Factors

M585 Warning:

100% of VMT has been assigned to the local roadway
 type for all hours of the day for all vehicle types
 with an average speed of 12.9 mph.

M 48 Warning:

there are no sales for vehicle class HDGV8b

Calendar Year: 2007
 Month: July
 Altitude: Low
 Minimum Temperature: 63.5 (F)
 Maximum Temperature: 89.9 (F)
 Absolute Humidity: 75. grains/lb
 Nominal Fuel RVP: 9.0 psi
 Weathered RVP: 8.7 psi
 Fuel Sulfur Content: 33. ppm

Exhaust I/M Program: No
 Evap I/M Program: No
 ATP Program: No
 Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.3872	0.3600	0.1237		0.0359	0.0004	0.0019	0.0854	0.0056	1.0000

Composite Emission Factors (g/mi):

Composite VOC :	1.470	1.438	2.327	1.665	2.438	0.543	0.972	0.893	3.45	1.560
Composite NOX :	0.725	0.883	1.251	0.977	2.693	0.943	1.207	9.607	0.92	1.678

 * MOBILE6.2.03 (24-Sep-2003) *
 * Input file: C:\MOBILE6\RUN\DATA\SPATS25B.IN (file 1, run 1). *

 M616 Comment:

will be used for all hours of the day. 100% of VMT
has been assigned to a fixed combination of freeways
and freeway ramps for all hours of the day and all
vehicle types.

M 48 Warning:

there are no sales for vehicle class HDGV8b

M 48 Warning:

there are no sales for vehicle class LDDT12

Calendar Year: 2025
Month: July
Altitude: Low
Minimum Temperature: 63.5 (F)
Maximum Temperature: 89.9 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 9.0 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: No
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000

Composite Emission Factors (g/mi):										
Composite VOC :	0.279	0.338	0.513	0.383	0.213	0.039	0.124	0.173	2.23	0.338
Composite NOX :	0.230	0.335	0.563	0.393	0.367	0.031	0.179	0.950	1.28	0.400

* #

* Principal Art 37.89 MPH

* File 1, Run 1, Scenario 3.

* #

M583 Warning:

The user supplied arterial average speed of 37.9
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M 48 Warning:

there are no sales for vehicle class HDGV8b

M 48 Warning:

there are no sales for vehicle class LDDT12

Calendar Year: 2025
Month: July
Altitude: Low

Minimum Temperature: 63.5 (F)
 Maximum Temperature: 89.9 (F)
 Absolute Humidity: 75. grains/lb
 Nominal Fuel RVP: 9.0 psi
 Weathered RVP: 8.7 psi
 Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
 Evap I/M Program: No
 ATP Program: No
 Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000

Composite Emission Factors (g/mi):										
Composite VOC :	0.303	0.353	0.539	0.401	0.253	0.044	0.138	0.207	2.32	0.360
Composite NOX :	0.222	0.318	0.538	0.375	0.339	0.026	0.153	0.781	1.17	0.370

* #
 * COLLECTOR 34.73 MPH
 * File 1, Run 1, Scenario 4.
 * #

M583 Warning:
 The user supplied arterial average speed of 34.7
 will be used for all hours of the day. 100% of VMT
 has been assigned to the arterial/collector roadway
 type for all hours of the day and all vehicle types.

M 48 Warning:
 there are no sales for vehicle class HDGV8b

M 48 Warning:
 there are no sales for vehicle class LDDT12

Calendar Year: 2025
 Month: July
 Altitude: Low
 Minimum Temperature: 63.5 (F)
 Maximum Temperature: 89.9 (F)
 Absolute Humidity: 75. grains/lb
 Nominal Fuel RVP: 9.0 psi
 Weathered RVP: 8.7 psi
 Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
 Evap I/M Program: No
 ATP Program: No
 Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000

Composite Emission Factors (g/mi):

Composite VOC :	0.313	0.360	0.549	0.408	0.270	0.046	0.144	0.222	2.38	0.370
Composite NOX :	0.221	0.316	0.536	0.372	0.331	0.026	0.151	0.769	1.15	0.367

* #####
 * LOCAL 15.1 MPH
 * File 1, Run 1, Scenario 5.
 * #####

* Reading Hourly Roadway VMT distribution from the following external
 * data file: C:\MOBILE6\RUN\FVMTLOCL.D

Reading User Supplied ROADWAY VMT Factors

M585 Warning:

100% of VMT has been assigned to the local roadway
 type for all hours of the day for all vehicle types
 with an average speed of 12.9 mph.

M 48 Warning:

there are no sales for vehicle class HDGV8b

M 48 Warning:

there are no sales for vehicle class LDDT12

Calendar Year: 2025
 Month: July
 Altitude: Low
 Minimum Temperature: 63.5 (F)
 Maximum Temperature: 89.9 (F)
 Absolute Humidity: 75. grains/lb
 Nominal Fuel RVP: 9.0 psi
 Weathered RVP: 8.7 psi
 Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
 Evap I/M Program: No
 ATP Program: No
 Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000

Composite Emission Factors (g/mi):

Composite VOC :	0.538	0.582	0.849	0.650	0.634	0.080	0.241	0.467	3.44	0.616
Composite NOX :	0.241	0.322	0.531	0.375	0.274	0.035	0.202	1.021	0.92	0.393


```
* Freeway 48.41 MPH
* File 1, Run 1, Scenario 2.
* #####
```

M582 Warning:

The user supplied freeway average speed of 48.4 will be used for all hours of the day. 100% of VMT has been assigned to a fixed combination of freeways and freeway ramps for all hours of the day and all vehicle types.

M 48 Warning:

```
there are no sales for vehicle class HDGV8b
```

M 48 Warning:

```
there are no sales for vehicle class LDDT12
```

Calendar Year:	2025
Month:	July
Altitude:	Low
Minimum Temperature:	63.5 (F)
Maximum Temperature:	89.9 (F)
Absolute Humidity:	75. grains/lb
Nominal Fuel RVP:	9.0 psi
Weathered RVP:	8.7 psi
Fuel Sulfur Content:	30. ppm

Exhaust I/M Program:	No
Evap I/M Program:	No
ATP Program:	No
Reformulated Gas:	No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.280	0.338	0.514	0.383	0.213	0.039	0.124	0.174	2.23	0.338
Composite NOX :	0.230	0.335	0.562	0.393	0.367	0.031	0.178	0.946	1.27	0.399

```
* #####
* Principal Art 36.80 MPH
* File 1, Run 1, Scenario 3.
* #####
```

M583 Warning:

The user supplied arterial average speed of 36.8 will be used for all hours of the day. 100% of VMT has been assigned to the arterial/collector roadway type for all hours of the day and all vehicle types.

M 48 Warning:

there are no sales for vehicle class HDGV8b
M 48 Warning:
there are no sales for vehicle class LDDT12

Calendar Year: 2025
Month: July
Altitude: Low
Minimum Temperature: 63.5 (F)
Maximum Temperature: 89.9 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 9.0 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: No
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000

Composite Emission Factors (g/mi):										
Composite VOC :	0.306	0.355	0.542	0.403	0.258	0.045	0.140	0.212	2.34	0.363
Composite NOX :	0.222	0.317	0.537	0.374	0.336	0.026	0.152	0.776	1.16	0.369

* #
* COLLECTOR 34.65 MPH
* File 1, Run 1, Scenario 4.
* #

M583 Warning:
The user supplied arterial average speed of 34.7
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M 48 Warning:
there are no sales for vehicle class HDGV8b
M 48 Warning:
there are no sales for vehicle class LDDT12

Calendar Year: 2025
Month: July
Altitude: Low
Minimum Temperature: 63.5 (F)
Maximum Temperature: 89.9 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 9.0 psi
Weathered RVP: 8.7 psi

Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: No
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000

Composite Emission Factors (g/mi):										
Composite VOC :	0.313	0.360	0.549	0.408	0.270	0.046	0.144	0.223	2.38	0.370
Composite NOX :	0.221	0.316	0.536	0.372	0.330	0.026	0.151	0.769	1.15	0.367

* #
* LOCAL 15.1 MPH
* File 1, Run 1, Scenario 5.
* #

* Reading Hourly Roadway VMT distribution from the following external
* data file: C:\MOBILE6\RUN\FVMTLOCL.D

Reading User Supplied ROADWAY VMT Factors

M585 Warning:
100% of VMT has been assigned to the local roadway
type for all hours of the day for all vehicle types
with an average speed of 12.9 mph.

M 48 Warning:
there are no sales for vehicle class HDGV8b

M 48 Warning:
there are no sales for vehicle class LDDT12

Calendar Year: 2025
Month: July
Altitude: Low
Minimum Temperature: 63.5 (F)
Maximum Temperature: 89.9 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 9.0 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: No
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
---------------	------	--------	--------	------	------	------	------	------	----	---------

GVWR:		<6000	>6000	(All)						
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000

Composite Emission Factors (g/mi):										
Composite VOC :	0.538	0.582	0.849	0.650	0.634	0.080	0.241	0.467	3.44	0.616
Composite NOX :	0.241	0.322	0.531	0.375	0.274	0.035	0.202	1.021	0.92	0.393
